Precision Investment Casting   1098

in various branches of industry in the USSR. Attention is given to rational working methods and to the latest developments in investment casting techniques and also to modern equipment and safety technique. Problems of increasing the quality of castings and measures for eliminating rejects in all basic operations are discussed in detail. The basic technical and economic indices are given and the advantages of investment casting are discussed. No personalities are mentioned. There are 21 Soviet references.

TABLE OF CONTENTS:

Card 2/5

MAKSIMOV, A.I., inzh.; SOROKIN, P.V., inzh.; VEDENKIN, S.G., prof.

Effect of active gas media on the lasting strength of
austenitic steel castings. Trudy TSNIITMASH 92:139-157
'59.   (MIRA 12:8)

(Steel--Corrosion)

MAKSIMOV, A.I., inzh.; SOROKIN, P.V., inzh.; DAVIDOVSKAYA, Ye.A.; kand. tekhn.nauk; VEDENKIN, S.G., prof.

Long-time strength of austenite steels in fuel combustion products and in superheated steam. [Trudy] TSNIITMASH 100:70-89 '59.   (MIRA 13:7)

(Heat-resistant alloys)

SOROKIN, P.V.; NALIVAYKO, Ya.I.

Making hollow patterns for investment casting with use of compressed
gas liquid. Lit.proizv. no.7:41 Je '60.   (MIRA 13:7)
          (Patternmaking--Equipment and supplies)
       . (Precision casting)

MAKSIMOV, A.I.; SOROKIN, P.V.; FEDOSOV, A.I.

Device for corrosion-erosion testing of heat-resistant materials
in combustion products of liquid fuels. Zav.lab. 27 no.10:1311-
1312 '61.   (MIRA 14:10)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i
mashinostroyeniya.
(Liquid fuels) (Testing machines)

| SUBJECT | USSR / PHYSICS | CARD 1 / 2 | PA - 1744 |

AUTHOR   SOROKIN,P.V., TARANOV,A.JA.
TITLE   The Polarization of Protons Elastically Scattered by C^{12}-Nuclei.
PERIODICAL Dokl.Akad.Nauk, 111, fasc.1, 82-84 (1956)
           Issued: 1 / 1957

I.T.DJATLOV and L.N.ROZENCVEJG (in connection with work carried out by the physical department of the physical-mathematical faculty c_ ' arkov of the State University "A.M.GOR'KIJ", No 6, 81 (1955)) showed that scattered protons are partly polarized, and they computed curves for the dependence of polarization P on the energy of the protons at different scattering angles. The present report deals with the experimental examination of these results, and furthermore the correctness of the phase analysis by H.L.JACKSON and A.I.GALONSKIJ, Phys.Rev. 89, 370 (1953) is checked. The apparatus used for measuring the degree of polarization P is discussed on the basis of a drawing. The protons, which are accelerated by means of an electrostatic generator, pass through a system of collimator openings and then impinge upon a solid carbon target. The amperage of the primary bundle is measured by means of a FARADAY cylinder and a current integrator. The scattered protons then impinge on an analyzer filled with helium (40 cm mercury column).
The protons scattered by He^4 can then impinge on two proportionality counters. The rather powerful analyzer can indicate the polarization of proton bundles with the intensity of 10^4 proton/sec. The formula for azimuthal asymmetry is given. For the intensity ratio at $\varphi = 0^o$ and at $\varphi = 180^o$ it applies that

SOROKIN, P. V. Cand Phy-Math Sci--(diss) "Study of the
polarization of protons, elastically dispersed by the nuclei
He^4, C^{12} and O^{16} " Khar'kov, 1957. 9 pp 22 cm. (Min of Higher
Education UkSSR. Khar'kov Order of Labor Red Banner State
Univ im A.M Gor"kiy,. 100 copies. Bibliography: p 9(11 names)

(KL, 23-57, 108)

SOROKIN, P. V., MAN'KO, V. I. KARAD'YEV, K. V., GAVRILOVSKIY, B. V.,
TARANOV, A. Ya. and VAL'TER, A. K.

"Polarization of Protons Scattered by O^{16} Spin and Parity of the 3,11 Mev
Level of the F^{17} Nucleus,"

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy
Physics, Moscow, 19-27 Nov 57.

Acad. Sci. USSR & Physico-Tech. Inst. Acad. Sci . Ukr SSR

SOROKIN, P. V., TARANOV, A. Ya., VAL'TER, A. K.,

"Investigation of Polarization of Protons Elastic Scattered from C^{12}"

Physical Technical Inst. Acad. Sci. Ukr SSR

AUTHORS: Val'ter, A. K., Malakhov, I. Ya., Sorokin, SOV/48-22-7-22/26
                  P. V., Taranov, A. Ya.

TITLE: Elastic Scattering of Protons on Si^{28} Nuclei. Spin and Parity
                  of the Levels of 4,31 and 4,73 MeV of the p^{29} Nucleus (Uprugoye
                  rasseyaniye protonov yadrami Si^{28}. Spin i chetnost' urovney
                  4,31 i 4,73 MeV yadra p^{29})

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958,
                  Vol. 22, Nr 7, pp. 871 - 876 (USSR)

ABSTRACT: The scattering cross-section of the reaction p - Si^{28} was
                  measured in order to establish the characteristics of the
                  excited states of the p^{29} nucleus. These states are connected
                  with the resonance mentioned in reference 1. The method of
                  measurement is described first. The proton beam was accelerated
                  in the electrostatic generator of the Physical-Technical In-
                  stitute of the AS Ukr SSSR. It is deflected by 90° by a magnetic
                  analyzer. It then passes through a system of collimating dia-
                  phragms with a diameter of 2 mm and strikes a silicon target.
Card 1/3   From the qualitative analysis it is ascertained, that the level
                  of 4,31 MeV can have a spin and a parity of $3/2^-$ or $1/2^-$. The

Elastic Scattering of Protons on Si^{28} Nuclei. Spin and   SOV/48-22-7-22/26
Parity of the Levels of 4,31 and 4,73 MeV of the P^{29} Nucleus

determination of the spin and the parity for the level of
$1/2^+$ with 4,73 MeV is beyond doubt. For a final determination
of the spin of the 4,31 level the computed curves were com-
pared with the experimental results. In order to compute the
scattering cross-section of the reaction p - Si^{28} in the range
from 1,6 to 2,2 MeV data from reference 5 were used. The
cross-section was computed according to formulae (1), (2)
and (3) without assuming a dependence of the phases on the
energy. The maximum divergence between the experimental points
and the computed curves did not exceed 25%. As a summary it is
stated, that the resonance half-widths found experimentally,
50 and 14 keV, differ considerably from the values found in
reference 1, 60 and 25 keV. The results of the phase analysis
are exposed. The ratio of the given level-widths and the
quantity

$$\frac{3\hbar^2}{2ma}$$ shows that the level of 4,31 MeV apparently is a single-

Card 2/3   stage level whereas the 4,73 MeV level is connected with a
much more complicated mechanism of excitation. The evidence

Elastic Scattering of Protons on Si^{28} Nuclei. Spin and
Parity of the Levels of 4,31 and 4,73 MeV of the P^{29} Nucleus   SOV/48-22-7-22/26

concerning the spins and parities of these levels substantiate
the preliminary experimental results of proton polarization in
an elastic scattering of p on Si28. There are 9 figures, 1
table, and 5 references, 0 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR   (Physical
and Technical Institute, AS Ukr SSR)

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The Polarization of Protons Elastically Scattered on Si^{28} Nuclei

references 6 and 7. The experiments were carried out on the electrostatic generator of the FTI AN USSR (Physico-Technical Institute, AS UkrSSR). Results are given by table 2, viz. for the scattering angles θ (in the center of mass system) of 60 and 90° for the following E_p-values: 1.7, 1.75, 1.8, 1.85, 2.0, 2.05, 2.10, 2.15. The experimentally determined polarization values agree with calculated values (which are also given by this table) within the error limits. The functions $P(E_p)$ are given in form of diagrams in figure 1 (for $\theta = 60^{\circ}$) and in figure 2 (for $\theta = 90^{\circ}$); a second ordinate shows the corresponding cross sections $\sigma(E_p)$, which were obtained as the results of a phase shift analysis. Two fully analogous diagrams are shown by figures 3 and 4, viz. for $\theta = 125^{\circ}$ and 150° respectively. There follows a short discussion of results. There are 4 figures, 2 tables, and 7 references, 3 of which are Soviet.

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SOV/56-35-6-10/44

The Polarization of Protons Elastically Scattered on Si^{28} Nuclei

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR
(Physico-Technical Institute of the Academy of Sciences,
Ukrainskaya SSR)

SUBMITTED: July 5, 1958.

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SOV/58-59-7-14796

21.5300

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 7, pp 32 - 33 (USSR)

AUTHORS: Sorokin, P.V., Val'ter, A.K., Taranov, A.Ya.

TITLE: Measurement of Proton Polarization by Means of a Helium Analyzer

PERIODICAL: Uch. zap. Khar'kovsk. un-t, 1958, Vol 98, Tr. Fiz. otd. fiz.-matem. fak., Vol 7, pp 119 - 135

ABSTRACT: The authors describe the development of an instrument for measuring the polarization of protons that have been elastically scattered by nuclei. The instrument consists of a scattering chamber and a helium analyzer. Owing to its large "aperture ratio", the instrument can be utilized to measure the polarization of low-intensity beams (10^4 protons/sec). Experiments in double proton-He^4 scattering, as well as measurements of the polarization of protons elastically scattered by C^{12} nuclei, have shown that the instrument permits the measurement of polarization degrees in excess of 3 to 5% for protons resulting from reactions with a cross section of 10^{-25} cm^2 . sterad^{-1}. The reactions in question occur in targets containing 10^{19} nuclei/cm^2 at a primary current of 1 μ amp.

The authors' résumé

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SOROKIN, P.U.

SOV/89-7-1-18/26

21 (7), 21 (8)

AUTHOR: Rudakov, V. P.

TITLE: IX All-Union Conference on Nuclear Spectroscopy
(IX Vsesoyuznoye soveshchaniye po yadernoy spektroskopii)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 1, pp 76-79 (USSR)

ABSTRACT: The IX All-Union Conference was held from January 26 to
February 2, 1959 at Khar'kov. More than 300 participants heard
100 lectures, the most important of which dealt with the
following fields. Nuclear Theory. General problem of β-decay.
A. S. Davydov (MGU): Theoretical classification of low-energy
excited nuclear states. L. K. Peker: Deformed nuclei. A. I.
Birbrair, L. K. Peker, L. A. Sliv (LFTI): Quadrupole
oscillations of deformed nuclei. Ya. V. Izynin, V. I. Gomanko,
S. P. Fayrko (ChPTI): Calculation of the first-state with matrix
elements for β-transitions by means of the generalized nuclear
model. D. P. Belozyor (IAE): Consideration of pair-correlation
in nuclei. ... (IAE): The application of the super-
conductivity model to nuclei for the purpose of calculating
their moments of inertia. P. E. Nemirovskiy (IAE): Problem of
the neutron stability of nuclei. ... G. Brosinskiy (IAE): The
present stage in the theory of β-decay. ... V. Tsiolkovskii.

...Galitskiy, V.... Larkin, Yu. V. Trebukhovskiy (IAE):
Measurement of the angular correlation between electrons and
neutrino in the decay of the neutron. ... V. I. Lebedev, V. V.
... , I. ... Rudnev (LFTI): Measurement of its correlation
Khar'kovskiy institut (Physico-technical Institute, Khar'kov).
between the transversal electron polarisation and circular
polarisation of γ-quanta occurring in the decay of
Sc[46] and Co[60]. Decay Schemes. γ-radiation of V[48]. ...
... , A. ... Yu. V. Gonchar, Ye. ... ...
Dzhuba, ... Ya. Kalakhov, ...
Khar'kovskiy institut (Physico-technical Institute, Khar'kov).
The Si[28,29,30], Ne[20](p,γ), Si[32-34](p,γ), A[40](p,γ) and K[41](p,γ)
reactions. D. G. Alkhazov, K. ... Grinberg, G. M. Gorinskiy,
K. Ch. Lemberg, V. V. Rozhdestvenskiy, L. K. Ershaking of the
Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physico-
technical Institute). Investigation of the Coulomb excitation
of the lower levels of some nuclei during their bombardment by
multiply charged ions (C, N, O, and Ne). A. I. Kalinin, ... V.
Rurik, ... Pokrovskiy, V. A. Yakovlev (SIAS): New isotopes
Tm[161], Ho[155], and Ho[157]. B. S. Dzhelepov, ...
Sergiyenko (LGU): Decay schemes of some electron-deficient
isotopes, set up on the basis of measurements of the coinci-
dence of the internal conversion electrons. ... spectroscopy
Engineering. ... ... Dzhelepov, B. I. ... ...
V. G. Chumin (SIAN): β-spectrometer with double focusing.
... Ya. Shchepkin (IAE): Improved β-spectrometer.
Barchuk, N. ... Belykh, V. I. Gomanko, ... (IPAN
UkrSSR): Magnetic spectrograph for heavy charged particles.
The representatives of the Ministerstvo radiotekhnicheskoy
promyshlennosti (Ministry of the Radio-engineering industry)
gave a report about new multipliers. The Conference was
closed by B. S. Dzhelepov, who stressed the fact that nuclear
tables and reference works ought to be published much more
quickly in order to be of real use to the experimenter.

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SOV/48-23-7-12/31

24(5),21(7)
AUTHORS:

Val'ter, A. K., Deyneko, A. S., Malakhov, I. Ya., Sorokin, P. V., Taranov, A. Ya.

TITLE:

The Elastic Scattering and the Radiation Capture of Protons by N^{14}-Nuclei (Uprogoye rasseyaniye i radiatsionnyy zakhvat protonov yadrami N^{14})

PERIODICAL:

ABSTRACT:

It is pointed out in the introduction that the investigations of the elastic scattering of the protons by N^{14}-nuclei were carried out by studying the levels of the O^{15}-nuclei, and a number of papers (Refs 1-7) are pointed out in this connection. In another paper (Ref 8), the reaction $N^{14}(p,\gamma)$ was investigated, and the results of these papers are shown in diagrams (Figs 2 and 3). In the present paper, the elastic scattering cross section is investigated in the energy range of 1.7 - 3.5 Mev. The measuring instrument used in these investigations is shown in figure 1, and the proton beam was generated by the electrostatic generator

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The Elastic Scattering
and the Radiation Capture of Protons by N^{14}-Nuclei   SOV/48-23-7-12/31

of the FTI AS UkrSSR. The elastic scattering cross section of the protons on N^{14}-nuclei was measured under the angles 54, 90, 141 and 154°, and the results are shown in diagrams (Figs 2-6). The curves $\sigma(E_p)$ show six narrow resonances and one wide resonance at 2.4 Mev. In order to determine the width of the levels, the value of the resonance energy was accurately determined, it was investigated how much the proton beam is monoenergetic, and the reaction $N^{14}(\cdot,\gamma)$ was studied. An experimental width of resonance of 7.5 kev was measured. The relative γ-yield was investigated in the resonance range of 1.8, 2.35 and 2.48 Mev, and the results are shown in 2 diagrams (Figs 7 and 8). By comparing the widths of the resonances thus obtained with the corresponding values for the resonance in the elastic scattering cross section, it becomes clear that the energetic scattering of the protons does practically not depend on the energy, and that the latter amounts to about ±8 kev. This determines the widths of the levels in the elastic scattering cross section at 17 and 40 kev, respectively. The levels of

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The Elastic Scattering
and the Radiation Capture of Protons by N^{14}-Nuclei

the O^{15}-nuclei are compiled in table 2, and it is ascertained that the results obtained are in good agreement with those obtained by other authors. The authors thank M. I. Gusev for the preparation of the N^{14}-target by the electromagnetic separator, and A. A. Tsygikalo and Yu. A. Kharchenko and the staff for the operation of the electrostatic generator. There are 8 figures, 2 tables, and 10 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR (Physico-technical Institute of the Academy of Sciences, UkrSSR)

Card 3/3

24(5),21(7)

AUTHORS: Val'ter, A. K., Malakhov, I. Ya,, Sorokin, P. V., Taranov, A. Ya.

TITLE: Elastic Scattering of the Protons by Ar^{40}-Nuclei

(Uprogoye rasseyaniye protonov yadrami Ar^{40})

ABSTRACT: In the introduction, it is ascertained that the investigation
of the elastic scattering of the protons by Ar^{40}-nuclei is
carried out by studying the levels of the K^{41}-nuclei. A non-
Russian paper is indicated (Ref 2) in which weak resonances
were determined at the energies of 1.9 and 2.48 Mev; the values
put forward are, however, considered inaccurate to obtain a
survey of the spins and parities of the respective levels. The
experiments described in the present paper were carried out
with the same instrument as the experiments described in the
previous paper of this issue. The elastic scattering cross
section was recorded under the angles of 90, 125 and 150° in an
energy range of 1.7 to 2.7 Mev. As the diagrams of

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Elastic Scattering of the Protons by Ar^{40}-Nuclei   SOV/48-23-7-13/31

figures 1, 2 and 3 show, two weak resonances can be observed in the elastic scattering cross section at E_p = 1.86 and 2.45 Mev, and further a number of resonances at energies over 2.5 Mev. A comparison of the experimental data with the data computed, as well as a determination of the widths of the levels, are not possible. It is further ascertained that the reaction $Ar^{40}(p,n)K^{40}$ is only realized by protons with the orbital momentum $1 = 3$ or $1 = 5$. Finally, the distance of the levels in the K^{41}-nuclei is evaluated, and is indicated with 20 kev at an excitation energy of 10 Mev. There are 3 figures and 6 references, 2 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR
              (Physico-technical Institute of the Academy of Sciences, UkrSSR)

Card 2/2

SOROKIN, P.V. (USSR)

"Resonance Scattering of Protons by Light Nuclei"

report submitted for the 2nd USSR Conference on Nuclear Reactions at Low and Intermediate Energies, Moscow, 21-28 July 1960.

65593

S/048/60/024/007/027/032/XX
B019/B056

24.6600

AUTHORS: Val'ter, A. K., Deyneko, A. S., Sorokin, P. V., and
             Taranov, A. Ya.

TITLE: The Elastic Scattering of Protons by Ne^{20} Nuclei

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
             Vol. 24, No. 7, pp. 884-886

TEXT: This paper was read at the 10th All-Union Conference on Nuclear
Spectroscopy, which took place from January 19 to January 27, 1960 at
Moscow. As a target, gaseous neon (90.5% Ne^{20}) at a pressure of 5 torr was
used in the measurements described. The cross section was measured at
angles of 55, 90, 125, 141, and 151° in the center-of-mass system. The
proton energy was varied in the range of from 1.6 - 3.4 Mev. The hetero-
geneity of the radiation was ±8 kev. From the results shown in Figs. 1 and
2, five well-marked resonances may be seen. In the first column of the
Table, the proton energies, in the second column the energies of the cor-
responding Na^{21} levels, in the third the level widths according to data
by Heaberli (Ref. 2) and according to data obtained by the authors a

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The Elastic Scattering of Protons by Ne^{20} Nuclei

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given. Furthermore, the spins and parities are given. The latter were obtained by a phase shift analysis. As shown by an investigation of the polarization of the protons scattered by Ne^{20} nuclei at an angle of 90^{0}, the polarization in the energy range of from 1 - 1.8 Mev attains 70% (Fig. 3). There are 3 figures, 1 table, and 7 references: 3 Soviet, 3 US, and 1 Dutch.

Резонансные энергии протонов и характеристики уровней Na²¹

E_p, MeV	Энергия уровня ядра Na²¹, MeV	Ширина уровня Г, keV		Спин и четность	$\dfrac{\Gamma_p}{\Gamma}$	Приведенная ширина γ², MeV см
		по нашим данным	по данным [2]			
1,81	4,18	121	180	3/2-	0,25	1,4·10⁻¹³
1,96	4,32	17	6	5/2+	0,84	0,8·10⁻¹²
2,15	4,50	27	17	3/2+		0,9·10⁻¹³
2,69	5,02					
3,18	5,48	80	110	1/2+		0,2·10⁻¹³

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B019/B056
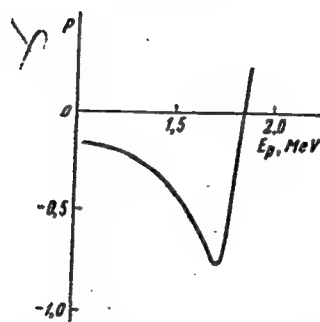
Рис. 3. Поляризация протонов, рассеянных ядрами Ne²⁰ под углом 90°

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83503

S/048/60/024/007/010/011
B019/B060.

26.2260

AUTHORS;   Deyneko, A. S., Popov, A. I., Sorokin, P. Ya.,
Taranov, A. Ya.

TITLE: A Magnetic Spectrometer With Double Focusing

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
Vol. 24, No. 7, pp. 924-928

TEXT: This is the reproduction of a lecture delivered at the 10th All-
Union Conference on Nuclear Spectroscopy held in Moscow from January 19
to 27, 1960. The spectrometer described here, which has a magnetic field
in sector form, is intended for the study of nuclear reactions brought
about by electrostatic accelerators. Since the energy of the products re-
sulting from the nuclear transformations examined with this spectrometer
do not exceed 8 Mev, it was not necessary for the $H\varrho$ to exceed $4 \cdot 10^5$ oe·cm.
A homogeneous field with 15,000 oe was easily attainable in the not very
large gaps. The radius of curvature of the particle path was found to be
320 mm. The distance from the target to the magnetic field entrance is
400 mm, and it is therefore possible to study the distribution of the

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A Magnetic Spectrometer With Double Focusing   S/048/60/024/007/010/011
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nuclear reaction products at an angle of 0 - 150°. The distance between
the photographic state and the point of exit of the particles from the
magnetic field is 700 mm. Fig. 2 shows a view of the spectrometer. The
magnet core is made of Armco iron, while the water-cooled magnetizing
coils are wound on copper bars. The resistance of the coils connected in
series is 1.38 ohms, the maximum power consumption is 2.2 kw. The magnetiz-
ing current is stabilized to within an accuracy of 0.05%, and the magnetic
field can be regulated between 2 and 15 koe. The proton energies which
the spectrometer is capable of recording are in the range of 0.2 and 8 Mev.
The spectrometer testing is dealt with in great detail. Fig. 3 shows the
magnetic field strength as a function of the coil current. Thorough investi-
gations revealed that the topography of the magnetic field does not change
with rising magnetic field strength, and 0.3% is given as the maximum
deviation of the field on the strength of the particle path. The maximum
inhomogeneity is 0.03% per centimeter. Fig. 4 shows the resolving power as
a function of the distance of the dector from the point of exit of the
particle out of the magnetic field. The best resolution is at 686 mm, which
is in good agreement with the projected distance of 700 mm. Fig. 5 shows
line shapes of α-particles, as were determined with a scintillation counter

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A Magnetic Spectrometer With Double Focusing   S/048/60/024/007/010/011
                                                  B019/B060

and a photographic plate. The half-widths are 0.15 and 0.16%, respectively.
It may be seen from these results that the spectrometer described here
meets the demands made on it satisfactorily. There are 5 figures and
6 non-Soviet references.

ASSOCIATION: Khar'kovskiy fiziko-tekhnicheskiy institut Akademii nauk
                 USSR
                 (Khar'kov Institute of Physics and Technology of the
                 Academy of Sciences UkrSSR)

Card 3/3

S/120/61/000/006/039/041
E032/E514

AUTHORS: Andreyev, G.B., Deyneko, A.S., Malakhov, I.Ya.;
             Sorokin, P.V. and Taranov, A.Ya.

TITLE: Production of thin Al_2O_3 films

PERIODICAL: Pribory i tekhnika eksperimenta, no.6, 1961, 149-150

TEXT: The aim of this work was to produce Al_2O_3 backing
films having a thickness of less than 0.1 μ for targets
evaporated onto them in vacuum. Such targets are suitable for
scattering experiments in nuclear physics. The films are
prepared as follows. A 40 μ aluminium foil is first etched
in a 30% solution of NaOH in order to clean the surface from
contamination. When a thickness of about 3 μ has been reached
the foil is oxidised for 2 to 3 min in a bath containing an
electrolyte which consists of 1.5% (by weight) of acetic acid
and 1.5% of aluminium acetate. The cathodes in the electro-
lytic bath are two aluminium plates and the foil to be oxidised
serves as the anode. The initial current density is varied
between 1 and 100 mA and the final oxidation voltage between

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S/048/61/025/010/001/003
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21.6000
AUTHORS: Zubritskiy, L. A., Popov, A. I., Sorokin, P. V., and
Samoylov, V. F.

TITLE: Semiconductor spectrometers of charged particles

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
v. 25, no. 10, 1961, 1286 - 1290

TEXT: The authors constructed a series of germanium and silicon spectro-
meters. They investigated the properties of these spectrometers by means
of α-particle radiation from a Po^{210} source. The voltage pulses obtained
from the detector were amplified by a linear amplifier and analyzed by
means of a 100-channel pulse analyzer of AИ-100 (AI-100) type. In
germanium spectrometers, n-type germanium with a resistivity of
40-45 ohm·cm is used. A surface-barrier p-n junction was produced by
sputtering gold on the germanium surface. The germanium plates (5·5·1 mm)
were etched in an CP-4 (SR-4) solution to obtain a regular reflecting
surface. The crystal was mounted in a crystal-holder. A small amount

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B104/B112

Semiconductor spectrometers...

of indium soldered to the upper surface of the crystal produced a
p-n junction. The construction is shown in Fig.1. The spectrometer was
investigated at nitrogen temperature. The volt-ampere characteristic
of the gold-germanium spectrometer described here is better than that of
the spectrometer described by M. L. Halbert and J. L. Blankenship (Nucl.
Instr. and Method., 8, 106 (1960)). If the voltage on the junction is
between 10 and 30 v the resolving power of the spectrometer is $<0.5\%$.
In silicon spectrometers, n-type silicon with a resistivity of 100 ohm·cm
is used. By sputtering boron on silicon plates ($4\cdot4\cdot1$ mm, 1200°C,
diffusion depth of boron $\lesssim1\mu$) a p-n junction is produced. After
finishing the diffusion process the p-layer is etched. The crystal is
fixed in a tantalum crystal holder. An aluminum contact is soldered to
the p-layer. The construction of the silicon instrument is the same as
that of the germanium instrument. The silicon spectrometer was
investigated at room temperature and nitrogen temperature. At room
temperature the resolving power of the spectrometer is 3% (if the voltage
on the junction is between 5 and 10 v). At nitrogen temperature, the
resolving power of the silicon spectrometer is 2.5% (voltage on the
junction between 50 and 180 v). Up to a voltage of 200 v, the current

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Semiconductor spectrometers...

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S/048/61/025/010/001/003
B104/B112

is weaker than 0.01 μa. The effective thickness of the sensitive layer
at 30 v is 55μ. It prevails over the thickness of the volume charge of
the p-n junction (28μ). The authors thank A. K. Val'ter and
A. Ya. Taranov for cooperation. There are 9 figures and 7 non-Soviet
references. The three most recent references to English-language
publications read as follows: Amsel G., Baruch P., Smulkowskiy O.,
Nucl. Instr. and Method, 8, 92 (1960); Fridland S., Mayer J., Wiggins J.,
Nucleonics, 18, 2, 54 (1960); Almen E., Larsh, G. E., Gordon, T.,
Sikkeland, Rev. Scient. Instrum., 31, 10, 1114 (1960).

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR (Physico-
             technical Institute of the Academy of Sciences UkrSSR),
             Khar'kovskiy gos. universitet (Khar'kov State University)

Card 3/4

SOROKIN, P.V.; POPOV, A.I.; STORIZHKO, V.Ye.; TARANOV, A.Ya.

Inelastic scattering of protons by Ne^{20} nuclei. Zhur. eksp. i teor. fiz. 40 no.5:1253-1256 My '61.   (MIRA 14:7)

1. Fiziko-tekhnicheskiy institut AN Ukrainskoy SSR.
(Protons—Scattering)
(Neon—Isotopes)

24,6600

40103
S/048/62/026/008/019/028
B104/B102

AUTHORS: Popov, A. I., Sorokin, P. V., Storizhko, V. Ye., and
             Taranov, A. Ya.

TITLE: Elastic scattering of protons by Mg^{25} and Mg^{26} nuclei

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
             v. 26, no. 8, 1962, 1074-1079

TEXT: Mg^{25} and Mg^{26} nuclei were bombarded by a proton beam from the
electrostatic accelerator of the FTI AN USSR. The spectra of the
elastically scattered protons were studied with a magnetic analyzer. The
reaction products were analyzed with a magnetic spectrometer. The Mg
targets were produced by a magnetic separator. The elastic scattering
cross sections of protons through angles of 90, 125, and 141° in the c.m.s.
were recorded. In the proton energy range of 1500-3700 kev (where the
energies correspond to excitation energies of Mg^{25} nuclei between 7800 and
9800 kev) 58 anomalies associated with Al^{26} levels have been detected.
The mean distance between these levels arising in elastic scattering is
40 kev. In the range of 1550-3750 kev (corresponding to excitation

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Elastic scattering of protons ...

energies of the compound nucleus Al^{27} between 9740 and 11,860 kev), 37 anomalies associated with Al^{27} levels have been found. The mean distance of these levels is 60 kev. The spins and parities of some levels were determined in a phase shift analysis of distinct resonances. There are 4 figures and 2 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR
                (Physicotechnical Institute of the Academy of Sciences
                UkrSSR)

Card 2/2

40105
S/048/62/026/008/021/028
B104/B102

24.6600

AUTHORS: Sorokin, P. V., Popov, A. I., Storizhko, V. Ye., and Taranov, A. Ya.

TITLE: Elastic scattering of protons from O^{18} nuclei

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 8, 1962, 1084-1088

TEXT: The differential cross section of 1.7-3.5 Mev protons scattered through angles of 90, 125, and 141° in the c.m.s. was measured. The O^{18} targets were obtained by a magnetic separator. The table gives the resonances found, the energies of the corresponding F^{19} levels, their spins and parities, and their widths. Spins and parities were determined from 13 distinct resonances by phase shift analysis. Within the limits of error the results are in good agreement with those found by others (R. R. Carlson et al., Phys. Rev., 122, 607 (1961); A. S. Deyneko et al., Izv. AN SSSR, Ser. fiz., 24, 924 (1960)). There are 3 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR (Physico-technical Institute of the Academy of Sciences UkrSSR)

Card 1/7

S/056/62/043/003/002/063
B125/B102

AUTHORS: Sorokin, P. V., Popov, A. I., Storizhko, V. Ye., Taranov,
A. Ia.

TITLE: Elastic and inelastic scattering of protons by Ne^{22} nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,
no. 3(9), 1962, 749-751

TEXT: Cross sections were measured of elastic (proton energies
1.6-3.2 Mev) and inelastic (1.9-3.2 Mev) scattering, Ne^{22}(p,pγ), through
the angles 90, 125, and 141° in the center-of-mass system and the
angular distribution of the 1.27-Mev γ-rays, using an apparatus described
by A. K. Val'ter et al. (Izv. AN SSSR, seriya fiz., 23, 639, 1959) and
P. V. Sorokin et al. (ZhETF, 40, 1253, 1961). The neon gas target was
enriched to 87% with Ne^{22}. The results of these measurements were
evaluated by the method of least squares under the following conditions:
The resonance investigated is related to a single level. Only the least
possible orbital moments l and l' take part in the reaction. The Ne^{22}
ground state has spin and parity 0$^+$, the first excited state 2$^+$. The

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Elastic and inelastic scattering ...

γ-transition between 2^+ and 0^+ is a pure E2-transition. In this case, the angular distribution of the inelastically scattered protons can be represented as $1+a_2\cos^2\theta$. The relative intensities of γ-transitions determined from the relative intensities of the peaks in the spectrum of the γ-rays range from 0.12 to 2.86 and the measured widths of these transitions from 15 to 33 kev. The reduced widths γ_p^2 calculated from the resonance integral are between 2.5 and 225 kev for $0.1 \leq \Gamma_p \Gamma_{p'}/\Gamma \leq 8$ kev. As the proton energy E_{lab} increases from 1.914 to 3.16 Mev the excitation energy of the Na^{23} level increases monotonically from 10.626 to 11.818 Mev. There are 1 figure and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physicotechnical Institute of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: January 24, 1962

Card 2/2

ANTUF'YEV, Yu.P.; EL'-SHESHENI, M.M.; SOAD, Kh.R.; SALCH, Z.A.; SOROKIN, P.V.

Study of the reaction $Li^6(d,\alpha)He^4$ at deuteron energies ranging from 1 to 2.5 Mev. Izv. AN SSSR. Ser. fiz. 27 no.11:1451-1455 N '63. (MIRA 16:11)

GUROR'EV, Yu. P.; BEDEVI, O. Ye.; EL'-NADI, L. M.; DARVISH, D... ie.; SOROKIN, P. V.

"Energy Levels of the Nucleus Si^{28}."

report suumitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

KhFTI (UkrainianPhysico Technical Inst, Khar'kov)

A. . . ., M. A.; ANTUF'YEV, Yu. P.; BARANIK, A. T.; EL'-ZAYKI, M. I.; NUER, T. M.; S

SORC .A........V.

"Investigations of the Reaction $Al^{27}(d,\alpha)Mg^{25}$ at Deuteron Energies 1.5 - 2.5 MeV. Dependence of the Intensity of Alpha Groups on the Spin of Levels of the Final Nucleus Mg^{25}."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

KhFTI (Ukrainian Physico Technical Inst, Khar'kov)

ABUZEYD, M.A.; ALI, F.M.; ANTUF'YEV, Yu.P.; BARANIK, A.T.; NUER, T.M.;
    SOROKIN, P.V.

Studying the reaction $Al^{27}(p,\gamma o)Mg^{24}$ in the proton energy range
1 - 2.5 Mev. Izv. AN SSSR. Ser. fiz. 28 no.1:46-50 Ja '64.
                                                        (MIRA 17:1)

1. Yegipetskaya atomnaya komissiya, Kair, Ob"yedinennaya Arabskaya
   Respublika.

ANTUF'YEV, Yu.P.; SOROKIN, P.V.

Circuit for dividing the working range of the AI-100-1 analyzer
into two subgroups of 50 channels each. Prib. i tekh. eksp. 9
no.3:79-80 My-Je '64   (MIRA 18:1)

ANTUF'YEV, Yu.P.: BEDEVI, O. Ye. [Badawy, O.E.]; EL'-NADI, L.M.;
    DARVISH, D.A. Ye. [Darwish, D.A.E.]; SOROKIN, P.V.

Energy levels of the Si^{28} nucleus. Izv. SN SSSR. Ser. fiz.
28 no.7:1156-1159 Jl '64   (MIRA 17:8)

1. Otdeleniye yadernoy fiziki Atomnoy komissii Ob"yedinennoy
Arabskoy Respubliki, Yegipet, Kair, i Fiziko-tekhnicheskiy
institut AN UkrSSR.

L 14497-65   EWT(m)   DIAAP/SSD/ESD(gs)/ESD(t)   S/0043/64/028/010/1717/1720
ACCESSION NR: AP4048645

AUTHOR: Abuzeyd,M.A.; Antuf'yev,Yu.P.; Baranik,A.T.; El'-Zayki,M.I.; Nover,T.M.;
Sorokin,P.V.

TITLE: Investigation of the (d,α) reaction on Al^{27} at deuteron energies from 1.5
to 2.6 MeV. Dependence of the α-group abundances on the spin of the final state of
Mg^{25} /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi
14-22 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.10, 1964, 1717-1720

TOPIC TAGS: nuclear physics, nuclear spectroscopy, excited state, deuteron reaction,
α-particle, spin, compound nucleus.

ABSTRACT: The energy and angular distributions of α-particles from the $Al^{27}(d,α)$-
Mg^{25} reaction were measured at 12 different deuteron energies from 1.506 to 2.54
MeV. The deuterons were accelerated in the electrostatic accelerator of the Egypt-
ian Atomic Commission, an unsupported aluminum target was employed, and the α-par-
ticles were recorded with semiconductor detectors. Eight α-particle groups were
distinguished, corresponding to ten Mg^{25} levels. The angular distributions of the

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various groups were measured at angles greater than 70°. The angular distributions varied greatly with deuteron energy but were generally symmetric about 90°. This indicates that the reaction proceeds by compound nucleus formation with participation of a moderate number of levels. The yields of the different α-particle groups were found by integrating the angular distributions. The results of integration were corrected for barrier penetration by the ejected α-particle, divided by $2I + 1$, where I is the spin of the corresponding Mg^{25} state; the final values are tabulated. The quotients (normalized to unity for the highest energy group) varied from 0.54 to 1.68. When the quotients for each group were averaged over all the incident deuteron energies, however, the variation was only from 0.89 to 1.22. It is concluded that the intensities of the α-particle groups from (d,α) reactions, when adequately averaged over the incident deuteron energy, are proportional to $2I + 1$, as indicated by the statistical compound nucleus theory, and can be employed to determine nuclear spins. The present results were compared with those obtained by N.MacDonald (Nucl.Phys.33,110,1962) with 10 MeV deuterons. The mean square deviation from proportionality to $2I + 1$ was 10% for the present data and 18% for those of MacDonald. "The authors thank El Nadi for cooperation in performing the work, El Nashar and Mustafa Raga for assistance in conducting the experiments, and N.Dobry*chenko for help in preparing the paper." Orig.art.has: 4 formulas and 2 figures.

2/3

ACCESSION NR: AP4019200   S/0056/64/046/002/0409/0414

AUTHORS: Antuf'yev, Yu. P.; Bunduk, T.; Fikri, A.; Machali, F.;
Sorokin, P. V.

TITLE: Investigation of the $Li^7(p, \alpha)He^4$ reaction induced by po-
larized protons with energy 0.5--2 MeV

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 409-414

TOPIC TAGS: lithium 7, helium 4, proton Alpha reaction, proton
polarization, sensitivity to proton polarization, elastic proton
scattering, left right asymmetry

ABSTRACT: The sensitivity of the $Li^7(p, \alpha)He^4$ reaction to proton
polarization, defined as the ratio of anisotropic component of the
reaction cross section to isotropic component, was measured using
polarized protons obtained from the elastic scattering reaction
$C^{12}(p,p)C^{12}$ at a 60° angle. The sensitivity $\underline{r}$ was determined from

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ACCESSION NR: AP4019200

the left-right asymmetry $\underline{R}$, defined as the ratio of the counter readings in positions 7 and 8, respectively (Fig. 1), using the relation

$$R = (1 + P_1 r)/(1 - P_1 r),$$

where P_1 is the polarization of the elastically scattered protons. At low energies and at an angle of 45° the sensitivity does not exceed 10%, but rises smoothly to 60% at 2 MeV with increasing proton energy. The results are in good agreement with those of L. Wolfenstein (Phys. Rev. v. 75, 1664, 1949) at 225° phase shift and of K. Bearpark et al (Nucl. Phys. v. 33, 648, 1962). "The authors are indebted to Prof. El-Nadi for collaboration in the work. We are grateful to A. M. El-Nashar, G. F. Kirshin, to Mustafa Raga for help with the experiments, and to G. Akseneva for help in preparing the article for publication." Orig. art. has: 5 figures, 3 formulas, and 1 table.

Card 2/3

ANTUF'YEV, Yu.P.; BUNDUK, T.; FIKRI, A.; MACHALI, F.; SOROKIN, P.V.

Study on the reaction Li^7 (p, α)He^4 induced by 0.5 - 2 Mev. polarized protons. Zhur. eksp. i teor. fiz. 46 no.2:409-414 F '64. (MIRA 17:9)

L 41402-66   EWP(e)/EWT(m)/T/EWP(t)/ETI   IJP(c)   JD

ACC NR: AP6019609 (A, N)   SOURCE CODE: UR/0048/66/030/002/0220/0223

63
B

AUTHOR: Sorokin, P.V.

ORG: Sorokin, P.V.

TITLE: On the sensitivity of the B-11 (p, gamma) C-12m and B-11 (p, alpha) Be-8 reactions near the 162 keV resonance to the polarization of the protons /Report, Fifteenth Annual Conference on Nuclear Spectroscopy and Nuclear Structure, held at Minsk, 25 Jan. to 2 Feb. 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 2, 1966, 220-223

TOPIC TAGS: nuclear reaction, nuclear resonance, proton polarization, boron, carbon, beryllium

ABSTRACT: The author has employed theoretical formulas given by A.Symon (Phys.Rev., 92, 1050 (1953)) and nuclear data given by D.S.Craig, W.C.Gross, and R.G.Jaris (Phys. Rev. A, 96, 825 (1954)) and P.I.Grant, F.C.Flack and I.G.Rutherglen (Proc.Phys.Soc. A, 67, 751 (1954)) to calculate the sensitivity of the B^{11} (p,γ)C^{12m} ($E_\gamma = 12$ MeV) and B^{11} (p,α)Be^8 (Q = 6.7 MeV) reactions to the polarization of the incident protons. The sensitivity to proton polarization of the B^{11} (p,γ) reaction was found to depend on the difference between the phase shifts for different channel spins. There are no experimental data on such phase shift differences; resonance reactions of the type

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L 41402-66

ACC NR: AP6019609

under discussion would provide a suitable tool for investigating them. In the B^{11} (p,α) reaction there is considerable interference between the 2^+ resonance level and a 1^- level with $l_p = 0$, as a result of which the reaction would be sensitive to the incident proton polarization even if the B^{11} $(p\gamma)$ reaction were not. The calculated sensitivity of the B^{11} (p,α) reaction to proton polarization is presented graphically as a function of proton energy near the 162 keV resonance for a scattering angle of 45° and different values of the phase shift difference. It is estimated that a 0.1 microamp polarized proton beam will be required for experimental investigation of the reactions. Orig.art. has: 7 formulas and 3 figures.

SUB CODE: 20   SUBM DATE: 00   ORIG. REF: 000   OTH REF: 005

Card 2/2

SOROKIN, P. Ya.

Overheating side-blown steel. P. Ya. Sorokin. *Liteinoe Proizvodstvo* 1955, No. 8, 23-5.—In side-blown vessels, C is eliminated by the endothermal reaction $FeO + C = CO + Fe$, so that the reaction merely cools the bath previously heated by Si and Mn oxidation. Subsequent oxidation of CO to CO_2 cannot heat the bath, since the calcns. based on gas analysis of 11 heats (tabulated) show that the heat brought in by the reaction can produce an av. gas temp. of 875°. Actual temp. measurements are not reported.

I. D. Gat

SOROKIN, P. Ya.

Iron volatilization from cast iron during after-blow of converters. P. Ya. Sorokin. *Invest. Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk* 1956, No. 8, 28-36.—The temp. of bursting air bubbles, measured with optical pyrometers under lab. conditions, is considerably higher than of the metals through which the air is blown. This local superheating causes satn. with Fe vapors at the local bubble temp. FeO may also be partially vaporized, but the usual explanation of the brown gas coloration at the converter mouth by the Fe vaporization, and not by its mech. entrainment, is not affected by FeO vaporization. During the passage of the gas bubble through the metal at a temp. higher than the metal temp., the Fe vapors are partially condensed, with the formation of fine Fe particles (fog). The fine fog and the uncondensed Fe vapors, on being carried out of the converter, are rapidly oxidized by the air. The progressive C reduction in the metal increases the relative Fe oxidation, raises the total heat balance of the system, and, in particular, the local heat balance in the air bubbles. The larger heat supply increases the Fe vaporization rate and the production of dense brown fumes at the end of the after-blow period. The after-blow of the metal with O, and especially of cast iron, sharply increases the Fe losses.

W. M. Sternberg

SOROKIN, P. Ya.

DUBROV, N.F., kand. tekhn. nauk; MIKHAYLOV, O.A., kand. tekhn. nauk;
FEL'DMAN, I.A.; DANILOV, A.M.; SOROKIN, P.Ya., kand. tekhn. nauk,
starshiy nauchnyy sotrudnik; BUTAKOV, D.K., kand. tekhn. nauk,
dots.; SOYFER, V.M.; LATASH, Yu.V., mladshiy nauchnyy sotrudnik;
ZAMOTAYEV, S.P.; BEYTEL'MAN, A.I.; SAPKO, A.I.; PETUKHOV, G.K.,
kand. tekhn. nauk; YEDNERAL, F.P., kand. tekhn. nauk, dots.;
LAPOTYSHKIN, N.M., kand. tekhn. nauk, starshiy nauchnyy sotrudnik;
ROZIN, R.M.; NOVIK, L.M., kand. tekhn. nauk, starshiy nauchnyy
sotrudnik; LAVRENT'YEV, B.A.; SHILYAYEV, B.A.; SHUTKIN, N.I.;
GNUCHEV, S.A., kand. tekhn. nauk, starshiy nauchnyy sotrudnik;
LYUDEMAN, K.F., doktor-inzh., prof.; GHUZIN, V.G., kand. tekhn.
nauk; BARIN, S.Ya.; POLYAKOV, A.Yu., kand. tekhn. nauk; FEDCHENKO,
A.I.; AGEYEV, P.Ya., prof., doktor; SAMARIN, A.M.; BOKSHITSKIY,
Ya.M., kand. tekhn. nauk; GARNYK, G.A., kand. tekhn. nauk;
MARKARYANTS, A.A., kard. tekhn. nauk; KRAMAROV, A.D., prof.,
doktor tekhn. nauk; TEDER, L.I.; DANILOV, P.M.

Discussions. Biul. TSNIICHM no.18/19:69-105 '57.   (MIRA 11:4)

1. Direktor Ural'skogo instituta chernykh metallov (for Dubrov).
2. Direktor TSentral'nogo instituta informatsii chernoy metallur-
gii (for Mikhaylov). 3. Nachal'nik nauchno-issledovatel'skogo
otdela osobogo konstruktorskogo byuro tresta "Elektropech'" (for
Fel'dman). 4. Nachal'nik martenovskoy laboratorii Zlatoustovskogo
metallurgicheskogo zavoda (for Danilov, A.M.). 5. Laboratoriya
protsessov stalevareniya Instituta metallurgii Ural'skogo filiala
AN SSSR (for Sorokin).   (Continued on next card)

DUBROV, N.F.——(continued)   Card 2.
    6. Ural'skiy politekhnicheskiy institut (for Butakov). 7. Starshiy
inzhener Bryanskogo mashinostroitel'nogo zavoda (for Soyfer).
8. Institut elektrosvarki im. Patona AN URRS (for Iatash). 9. Na-
chal'nik TSentral'noy zavodskoy laboratorii "Uralmashzavoda" (for
Zamotayev). 10. Dnepropetrovskiy metallurgicheskiy institut (for
Sapko). 11. Moskovskiy institut stali (for Yedneral). 12. TSentral'-
nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for
Gmuchev, Lepotyshkin). 13. Starshiy master Leningradskogo zavoda
im. Kirova (for Rozin). 14. Institut metallurgii im. Baykova AN
SSSR (for Novik, Polyakov, Garnyk). 15. Nachal'nik tekhnicheskogo
otdela zavoda "Bol'shevik" (for Iavrent'yev). 16. Starshiy inzhe-
ner tekhnicheskogo otdela Glavspetsstali Ministerstva chernoy
metallurgii (for Shilyayev). 17. Zamestitel' nachal'nika tekhni-
cheskogo otdela zavoda "Elektrostal'" (for Shutkin). 18. Frey-
bergskaya gornaya akademiya, Germanskaya Demokraticheskaya
Respublika (for Lyudeman). 19. Zaveduyushchiy laboratoriyey stal'-
nogo lit'va TSentral'nogo nauchno-issledovatel'skogo instituta
tekhnologii i mashinostroyeniya (for Gruzin). 20. Starshiy master
elektrostaleplavil'nykh pechey Uralvagonzavoda (for Barin).
21. Zamestitel' nachal'nika elektrostaleplavil'nogo tsekha zavoda
"Sibelektrostal'" (for Fedchenko). 22. Zaveduyushchiy kafedroy
metallurgii stali i elektrometallurgii chernykh metallov Lenin-
gradskogo politekhnicheskogo instituta (for Ageyev). 23. Zame-
stitel' direktora Instituta metallurgii im. Baykova AN SSSR, chlen-
korrespondent AN SSSR (for Samarin).
                            (Continued on next card)

DUBROV, N.F.——(continued) Card 3.
24. Nachal'nik laboratorii TSentral'nogo nauchno-issledovatel'skogo
instituta chernoy metallurgii (for Bokshitskiy). 25. Zaveduyushchiy
kafedroy elektrometallurgii Sibirskogo metallurgicheskogo insti-
tuta (for Kramarov). 26. Nachal'nik elektrostaleplavil'nogo tsekha
Kuznetskogo metallurgicheskogo kombinata (for Tedor). 27. Nachal'-
nik elektrometallurgicheskoy laboratorii Kuznetskogo metallurgiche-
skogo kombinata (for Danilov, P.M.).
                              (Steel——Metallurgy)

SOROKIN, P. Ya.

"Production of Low-Carbon Ferro-Chrome by Blowing and Vacuum Treatment,"

paper presented at Second Symposium on the Application of Vacuum Metallurgy.

1-6 Jul. 1958, Moscow

81489

SOV/137-59-5-9971

/8.7110

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 76 (USSR)

AUTHORS: Sorokin, P.Ya., Petrov, K.M., Kokin, A.I.

TITLE: The Problem of Vacuum-Degassing of Steel for Electrical
             Engineering Purposes

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AS USSR, 1958, Nr 2,
             pp 67 - 72

ABSTRACT: The Institute of Metallurgy UFAN USSR together with the
             Verkh-Issetskiy Plant investigated the effect of vacuum
             treatment on the quality of transformer steel smelted in
             a basic electric furnace. Vacuum treatment was carried
             out under laboratory conditions in a chamber containing a
             ladle of ~ 40 kg capacity filled with metal. The metal
             was kept in the chamber for 8 - 10 minutes with a vacuum
             of 97 - 98%. Experiments were carried out with vacuum treat-
             ment of liquid steel in a 500-kg mold during the siphon-
             filling process. The experimental mold was equipped with a
Card 1/3   flange in its upper section to fasten the cover. The mold

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The Problem of Vacuum-Degassing of Steel for Electrical Engineering Purposes

was filled within 2 - 2.5 minutes under violent effervescence of the metal.
The vacuum was on the average 425 mm Hg. Under industrial conditions, vacuum
treatment was performed in a chamber holding a 20-ton ladle with liquid metal.
During rarefaction of 650 - 700 mm Hg a violent gas liberation occurred during
3 - 4 minutes, accompanied by a boiling of the metal and ascent of the slag.
Ten minutes after vacuum treatment, bubbling continued only there where the
slag contacted the lining of the ladle. Gases pumped out of the chamber con-
tained CO_2, CO, H_2 and H_2S. Heavy corrosion of the refractory lining of the
ladle and the stopper coils was observed 8 - 10 minutes after the vacuum
treatment began. This limited considerably the duration of the vacuum treat-
ment. Metal subjected to vacuum treatment in a laboratory chamber, or during
filling of the mold, showed a reduction of [H] and improved bending charac-
teristics. It was noted that vacuum treatment of large metal masses did not
considerably improve the quality of the metal. It is pointed out that this is
caused by the secondary saturation of the metal with [H] during its contact
with the refractories within the siphon. It was established that vacuum treat-
ment of metal in a ladle promoted the refinement of the grain structure in cast

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SOV/137-59-5-9971

The Problem of Vacuum-Degassing of Steel for Electrical Engineering Purposes

steel. Conventional ingots had uniform transcrystallization, while vacuum-cast ingots had a uni-axial crystalline structure. As a result of vacuum treatment [H] was reduced by 25 - 40%, and the amount of non-metallic impurities by 25 - 30%.

V.P.

Card 3/3

SOV/137-58-11-22143

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 45 (USSR)

AUTHORS: Sorokin, P. Ya., Zabaykin, A. V., Babich, P. P., Zakharov, O. A.

TITLE: Continuous Measurement of the Temperature of Liquid Steel in the Ladle (Nepreryvnyy zamer temperatury zhidkoy stali v kovshe)

PERIODICAL: Prom-ekon. byul. Sov. nar. kh-va Sverdl. ekon. adm. r-na, 1958, Nr 4, pp 3-6

ABSTRACT: The measurements are made in ladles of 30-45 t capacity by Pt/Ph-Pt thermocouple introduced into the ladle either by a dummy stopper from above or through the nozzle of the spare pouring aperture in the bottom of the ladle. The thermocouple junction is protected by covers made on a Zr-oxide base and are installed at 200-300 mm from the ladle bottom. The experiments conducted showed the temperature of the metal (Me) in the ladle, when under an adequate layer of slag, drops not at a gradient of 2-3°C/min, as had previously been held, but considerably more slowly. The method of continuous measurement of the temperature of the liquid steel makes it possible to determine the length of time during which the Me should be held in the ladle after the heat has been tapped, and this facilitates purification from nonmetallic

Card 1/2

SOV/137-58-11-22143

Continuous Measurement of the Temperature of Liquid Steel in the Ladle

and gas inclusions.

V. G.

Card 2/2

SOV/133-58-11-7/25

AUTHOR: Sorokin, P.Ya., Candidate of Technical Sciences

TITLE: Balance of Experimental Converter Smelting with Oxygen
            Blast (Balans opytnoy konverternoy plavki na kislorodnom
            dut'ye)

PERIODICAL: Stal', 1958, Nr 11, pp 987 - 992 (USSR)

ABSTRACT: As the determination of the amount of oxidised metal
            during oxygen blowing under industrial conditions is
            inaccurate, experimental heats in a 50 kg laboratory
            converter, lined with chamotte bricks (walls 115 mm and
            bottom 240 mm thick) were carried out. The tuyere
            possessed two nozzles 6 mm in diameter and was made from
            a piece of fused magnesite. The laboratory set-up is shown
            in Figure 1 and all experimental materials charged and
            produced with the exception of fumes were weighed. The
            composition of starting and produced materials and fumes
            is given in Tables 1 and 2, respectively; the material
            balance -- Table 3. It was established that under
            experimental conditions, the majority of slag-forming
            elements are volatile; therefore, the weights of slag
            were checked on the basis of alumina content. As by
            direct experiments it is difficult to establish the actual
Card1/3   state of the elements eliminated during blowing, three

SOV/133-58-11-7/25

Balance of Experimental Converter Smelting with Oxygen Blast

modifications of heat balance were made in which the
elements eliminated were assumed to be in the form of
oxides, liquid and vapour state (Tables 4 and 5). The
best heat balance was obtained when assuming that the
eliminated elements were in the form of vapour. The
results obtained indicated that the elimination (burning
out) of slag-forming elements during blowing with oxygen
amounted to: iron 9.5%, silicon 15.3%, chromium 16.01%
and manganese 18.6%. Altogether about 24% of the total
heat evolved is used for the evaporation of slag-forming
elements. In respect of the utilisation of heat, the
most economical would be supplying oxygen to the bottom
of the converter through the tuyeres with a minimum
possible cross-section of nozzles. A large surplus of
heat characteristic for the converter process with an
oxygen blast should be utilised for melting scrap and

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Balance of Experimental Converter Smelting with Oxygen Blast

reduction of iron ore. The dilution of oxygen with
leaning gases or steam in order to reduce localised high
temperatures in the reaction zone from the point of view
of heat utilisation is not advantageous.
There are 2 figures, 5 tables and 9 references, 7 of
which are Soviet, 1 English and 1 German.

ASSOCIATION: Institut metallurgii UFAN SSSR (Institute of
               Metallurgy of the Urals Branch, AS USSR)

Card 3/3

AUTHORS: Sorokin, P.Ya., Mikhaylikov, S.V.   32-3-21/52

TITLE: Continuous Measuring of Metal Temperatures in Laboratory Induc-
             tion Furnaces (Neprervvnyy zamer temperatur metalla v labora-
             tornykh induktsionnykh pechakh)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 3, pp. 311-312 (USSR)

ABSTRACT: An induction furnace with a holding capacity of 7 kg metal melt
             and with a thermocouple element (consisting of a tungsten-molyb-
             denum-couple) is described. The thermocouple element is provided
             with a protective top made of a material based upon zirconium
             oxide, which protrudes through the bottom of the furnace, which
             is made of magnesite, into the melt. A schematical drawing of the
             furnace as well as several graphs showing temperature modifications
             during continuous measurement are given. Temperature measurements
             carried out at 1600° C with a platinum-platinum-rhodium couple
             agreed with measurements carried out simultaneously with the tung-
             sten-molybdenum couple. The zirconium-oxide top did not change in
             the course of measurements, so that a mechanical destruction need
Card 1/2   not be feared except as a result of carelessness. There are 2

Continuous Measuring of Metal Temperatures in Laboratory   32-3-21/52
Induction Furnaces

        figures.

ASSOCIATION: Institute for Metallurgy of the Ural Branch AS USSR (Institut
              metallurgii Ural'skogo filiala Akademii nauk SSSR)

AVAILABLE: Library of Congress

        1. Induction heating   2. Metals-Temperature factors
        3. Thermocouples-Applications

Card 2/2

8(4)   SOV/32-24-12-21/45
AUTHORS: Sorokin, P. Ye., Zabaykin, A. V., Babich, F. P., Zakharov, O.A.

TITLE: Continuous Measurement of the Temperature of Molten Steel in
              the Ladle (Nepreryvnyy zamer temperatury zhidkoy stali v
              kovshe)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 12, pp 1475-1477
              (USSR)

ABSTRACT: Immersion thermoelements give better results than optical
              apparatus in the measurement of the temperature of molten
              metals. From 1952 to 1954 continuous temperature measurements
              were carried out in liquid steel still in ladles holding 30-
              45 tons by the institute mentioned in the Association in col-
              laboration with Ural'skiy vagonostroitel'nyy zavod (Ural
              Car-Building Plant) and Zavod transportnogo mashinostroyeniya
              v Chelyabinske (Transport Machine-Building Plant in Chelyabinsk).
              The thickness of the lining of the ladles used was 200 mm
              (walls) and 350 mm (floor). In one case the thermoelement was
              mounted as a pseudo seal (Fig 1), while in another case it
              was introduced through the outlet (Fig 2). The experimental
Card 1/2   results obtained (Figs 3-5) indicate the following: the

SOV/32-24-12-21/45

Continuous Measurement of the Temperature of Molten Steel in the Ladle

temperature of the liquid metal becomes stable at a particular level after 15 minutes (curve of the figure). During the casting process the temperature of the liquid metal increases slowly in the case where a slag layer of 200-250 mm thick is present, or remains constant in the case where the slag layer is thinner. Contrary to wide-spread opinion, the temperature of the metal increases at the end of the casting process, and this finding agrees with the work of Van Gryunvigen and Lauter (Ref 2), Pronov (Ref 3), Gruzin (Ref 4), and Boos and Vil'yams (Ref 5). The temperatures determined using optical pyrometers are always lower than those obtained using thermoelements. The temperatures in the upper metal layers are greater than in the lower layers (Figs 3,4). There are 5 figures and 5 Soviet references.

ASSOCIATION: Institut metallurgii Ural'skogo filiala Akademii nauk SSSR (Institute of Metallurgy of the Ural Branch, Academy of Sciences, USSR)

Card 2/2

15(2) 15.2210   66580

AUTHOR: Sorokin, P. Ya.   SOV/131-59-11-7/13

TITLE: Zirconium Tips of Thermocouples for the Measurement of
               Temperature of Liquid Steel

PERIODICAL: Ogneupory, 1959, Nr 11, pp 517-522 (USSR)

ABSTRACT: The Institut metallurgii Ural'skogo filiala AN SSSR
               (Metallurgical Institute of the Ural Branch of the Academy
               of Sciences, USSR) worked out a method of producing such
               zirconium tips. These are produced from a mass on the basis
               of technical zirconium dioxide with a content of 96.06% ZrO_2,

               0.96% SiO_2, 0.26% TiO_2. Fireproof clay was used as binding

               agent, and chemically pure silicon oxide was employed to
               stabilize the zirconium dioxide. As of late, calcium oxide
               is recommended for use as stabilizing agent, as may be observed
               from reference 4. The production of tip blanks is described
               in detail. The blanks are burnt during 2 hours at a tempera-
               ture of 1700-1750°, and subsequently cooled to 100-150°
               together with the furnace. Shrinkage with burning amounts to
               25-30%. The tips are pressed from a carefully prepared mass,
Card 1/3   as shown in figure 1 and subsequently described. The tips are

Zirconium Tips of Thermocouples for the Measurement   66580
of Temperature of Liquid Steel   SOV/131-59-11-7/13

tested under laboratory and operational conditions, and are
dipped into liquid steel without prior heating to attain a
temperature of 1600-1650°. After cooling to 15-20° they are
once again introduced into a furnace with a temperature of
1500° without undergoing destruction (see figures 2 and 3).
For a comparison, figure 4 shows alundum tips which were dipped
into liquid steel after prior heating, and which burst
immediately in the process. Figure 5 shows three tiles with
inserted tips which were left for about two hours in liquid
steel at a temperature of up to 1780°. In an acid Martin
furnace of the metallurgicheskiy zavod im. Serova (Metallurgi-
cal Works imeni Serov) experiments were made with an
uninterrupted temperature measurement of liquid steel, and
good results were obtained. The following persons took part
in these experiments: V. F. Isupov, P.P. Semenenko, I.G.Fadeyev,
A.A. Chepurnova, Yu.F. Prosyanov, G.A. Bolotov, V.G.Tyumbayev,
A.S. Gorbunov, I.Ye. Mosyagin. Experiments to determine the
electric insulation properties of the zirconium dioxide tips
were made by S.V. Shtengel'meyyer. The table supplies data
Card 2/3   concerning the change of the electromotive force of thermo-

Zirconium Tips of Thermocouples for the Measurement
of Temperature of Liquid Steel

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electrodes depending on the heating rate of zirconium tips.
Figure 6 shows the temperature course of the metal of two
melts in the furnace, that were measured by means of an
uninterruptedly acting thermocouple. Figures 7, 8, and 9 show
the thermocouple and the tips after a stay of about 55-70 min
in liquid steel. The author states in conclusion that the
first laboratory experiments with tips on the basis of
zirconium dioxide yielded good results. It is suggested that
a large experimental stock of such tips be produced according
to the method of the Institut metallurgii Ural'skogo filiala
AN SSSR (Metallurgical Institute of the Ural Branch of the
Academy of Sciences, USSR), and that they be tested in a
number of metallurgical works. There are 9 figures, 1 table,
and 5 Soviet references.

ASSOCIATION: Institut metallurgii Ural'skogo filiala AN SSSR (Metallurgical
Institute of the Ural Branch of the Academy of Sciences, USSR)

Card 3/3

SOROKIN, I'YA

PHASE I BOOK EXPLOITATION   SOV/4613

Akademiya nauk SSSR.   Ural'skiy filial. Institut metallurgii

Voprosy kontrolya i kompleksnogo ispol'zovaniya syr'ya v metallurgii
 (Problems of Control and Complete Utilization of Raw Materials in Metal-
 lurgy) Sverdlovsk, 1960. 194 p. (Series: Its: Trudy, vyp. 5) Errata
 slip inserted. 1,000 copies printed.

Resp. Eds.: M. I. Kochnev, and V. P. Chernobrovkin, Candidates of Technical
 Sciences. Ed. of Publishing House: I. M. Demin; Tech. Eds.: L. A. Izmodenova,
 and N. F. Seredkina.

PURPOSE: This collection of articles is intended for technical personnel of
 metallurgical plants and for members of scientific research institutes.

COVERAGE: The collection contains articles discussing a variety of problems
 pertaining to ferrous and nonferrous metallurgy. A number of articles
 describe new methods for investigating the properties of alloys and oxides
 and review changes which these properties undergo as a result of the effect
 of temperature and other factors. Findings of studies are summarized

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Problems of Control and Complete (Cont.)   SOV/4613

in numerous articles and processes to be used for manufacturing ferroalloys
and naturally-alloyed steels are suggested. Characteristics of various
metal compounds are given and measures for the most efficient utilization of
ores are indicated. Some of the articles are devoted to the study of problems
of manufacturing ferrous , nonferrous, and rare metals. The selection of
topics was made on the basis of the need for material relating to the improve-
ment of the quality control of alloys and the manufacturing processes employed
to produce them. No personalities are mentioned. Each article is accompanied
by references, most of which are Soviet.

TABLE OF CONTENTS:

Card 2/5

PHASE I BOOK EXPLOITATION   SOV/4548

Akademiya nauk SSSR. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali

Primeneniye vakuuma v metallurgii (Use of Vacuum in Metallurgy) Moscow, Izd-vo
AN SSSR, 1960. 334 p. Errata slip inserted. 4,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova.
Komissiya po fiziko-khimicheskim osnovam proizvodstva stali.

Resp. Ed.: A.M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of
Publishing House: G.M. Makovskiy; Tech. Ed.: S.G. Markovich.

PURPOSE: This collection of articles is intended for technical personnel interest-
ed in recent studies and developments of vacuum steelmaking practice and equip-
ment.

COVERAGE: The book contains information on steel melting in vacuum induction fur-
naces, and vacuum arc furnaces, reduction processes in vacuum, and degassing of
steel and alloys. The functioning of apparatus and equipment, especially
vacuum furnaces and vacuum booster pumps is also analyzed. Personalities are
mentioned in connection with some of the articles and will appear in the Table
of Contents. Three articles have been translated from English. Some of the

SOROKIN, P.Ya.

Preparation of low-carbon ferrochromium by blowing in vacuum.
Trudy Inst.met.UFAN SSSR no.5:11-20   '60.   (MIRA 13:8)
                (Iron-chromium alloys)
                (Vacuum metallurgy)

S/133/60/000/011/006/023
A054/A029

AUTHOR: Sorokin, P.Ya., Candidate of Technical Sciences

TITLE: On the Vacuum Treatment of Bessemer Steel

PERIODICAL: Stal', 1960, No. 11, pp. 988-991

TEXT: The author discusses an article of A.M. Samarin, L.M. Novik, G.
E. Tsukanov, M.P. Kuznetsov and A.I. Lukutin, published in Stal', No. 3,1959
on the vacuum treatment of molten steel in the ladle, asserting that degasifi-
cation takes place uniformly throughout the metal. This assertion is not
proved as the article in question contains only one diagram showing the changes
in the hydrogen content of metal samples taken from the upper layers of the
metal and at the 320,680, 1,080 and 1,380 mm levels from the metal surface in
a 22 ton ladle from 18 test castings with vacuum treatment out of 38. The
authors did not publish any analyses of samples taken from such layers, in
which the ferrostatic pressure exceeded the value of vacuum. Their theory
cannot be accepted as correct since, moreover, only 3 samples were taken from
the border layer in which the vacuum was still active, (1,380 mm), while in
all of the samples taken from lower layers a rising H-quantity could be observ-
ed. In the Institut metallurgii UFAN (UFAN Metallurgical Institute) and in

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On the Vacuum Treatment of Bessemer Steel   S/133/60/000/011/006/023
                                               A054/A029

the Metallurgicheskiy kombinat im. A.K. Serova (Metallurgical Combine im. A.
K. Serov) with the cooperation of S.V. Nagornyy, V.F. Usipov, E.A. Pastukhov,
I.G. Fadeyev, P.P. Semenenko and others, the vacuum treatment of molten steel
was tested in 4-ton ingot molds for 15 minutes and it was found that the effect
of vacuum treatment (producing a concentrical, bright zone in the templates)
decreased as the depth increased whilst it ceased completely at about 1,400 mm
from the top level of the molten metal, which corresponded to the calculated
depth, at which the vacuum effect was expected to cease (at a vacuum of 650 mm
Hg). Similar results were obtained for products rolled from various layers of
vacuum-treated castings. Moreover, the better mechanical properties of rail-
steels which must be put down to the alloying with aluminum were attributed
erroneously to vacuum treatment, whereas this actually should be attributed to
the disintegration of the metal cores. The author of the present article also
found that the rack-type cooling apparatus constructed of water cooling pipes,
as applied in the Dzherzhinskiy and Zaporozhstal' Plants, was not suitable for
application in combination with the vacuum equipment as it produced an un-
necessary resistance against the effusing gases thus decreasing the optimum
vacuum possible. Vacuum treatment is most effective when accompanied by a
coercitive circulation of the metal, produced by blowing inert gases through

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On the Vacuum Treatment of Bessemer Steel   S/133/60/000/011/006/023
                                                   A054/A029

the molten metal during vacuum treatment. There are 2 figures and 7 references: 1 English, 1 German and 5 Soviet.
ASSOCIATION: Institut metallurgii UFAN (UFAN Metallurgical Institute)

Card 3/3

SOROKIN, F.Ye.

Use of MShShI-400 machines. Svar. proizv. no.8:16-18 Ag '65.
(MIRA 18:8)

1. Leningradskiy zavod "Elektrik".

27126
S/080/60/033/008/019/022/XX
D213/D305

5.3400

AUTHORS: Balandin, A.A., Freydlin, L.Kh., Rozina, V.S.,
             Sorokin, P.Z., and Voroshilov, G.A.

TITLE: Method of preparing 2-isopropylanthraquinone

PERIODICAL: Zhurnal prikladnoy khimii, v. 33, no. 8, 1960,
             1893 - 1896

TEXT: Recently alkylanthraquinones have been applied as hydrogen
carriers in producing hydrogen peroxide. It has, therefore, been
necessary to look for new methods of preparing these compounds on
an industrial scale. The specific reaction with which the authors
were concerned was to prepare 2-isopropylanthraquinone in two sta-
ges, instead of four as in Scholl's method, which involved react-
ing isopropylbenzene with phthalic anhydride and reducing the re-
sulting 4-isopropylbenzoyl-2-benzoic acid to 4-isopropanyl-benzyl-
2-benzoic acid followed by cyclization of the latter in the presen-
ce of sulphuric acid. To avoid the formation of sulphonic acid

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D213/D305

Method of preparing ...

derivatives and to increase the yields of the required quinone the
authors investigated the influence of the oleum concentration, tem-
perature and period of heating. In the case of 3 % oleum and heat-
ing for 1 - 3 hours sulphonation occurred. When the concentration
was increased to 8 % the yield of quinone was 15 %; however, this
yield decreased when 12 - 20 % oleum was used. The effect of heat-
ing with 8 % oleum is shown, and it is clear that the time of re-
action determines the yield of quinone. Best results were obtained
with reaction times of 2.5 - 3 hours, and under optimum conditions
the yield reached 55 - 60 %. In the earlier investigations the
first stage, condensation of phthalic anhydride with isopropylben-
zene, was conducted in a carbon disulphide medium. The authors,
however, used chlorobenzene as a less hazardous solvent and achie-
ved 88 % yields of 4-isopropylbensoyl-2-benzoic acid. The quinone
obtained in the present work had a melting point of $56.5 - 57.0^{\circ}C$,
(recrystallized from alcohol) as compared with $45^{\circ}C$ given in the
literature. The composition and properties of the resulting pro-
duct corresponded to those of isopropylanthraquinone. The quinone

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Method of preparing ...

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D213/D305

obtained in both the laboratory apparatus and the model plant had
a melting point of $56^{\circ}C$ and its C and H contents corresponded with
the formula $C_{17}H_{14}O_2$. The use of isopropylanthraquinone as a hy-
drogen transferring agent was studied by hydrogenating the compound
in the presence of a skeletal nickel catalyst until a thick mass
of 2-isopropylanthrahydroquinone was formed. After separation of
the catalyst the product was oxidized with air and the hydrogen
peroxide formed was removed with water. A similar reaction has
been found to proceed with 2-ethylanthraquinone. In both cases the
melting point of the material recovered corresponded to that of
the original quinone. There are 1 figure, 1 table and 2 non-Sov-
iet-bloc reference. The reference to the English-language publi-
cation reads as follows: A.T. Peters, F.M. Rowe, J. Chem. Soc.,
181, 1945.

SUBMITTED: February 25, 1960

Card 3/3

L 60044-65   EWT(m)/EPF(c)/EWP(j)   Pc-4/Pr-4   RM

ACCESSION NR: AP5018037   UR/0191/65/000/007/0027/0029
   678.86

AUTHOR: Svitsyn, R. A.; Zhigach, A. F.; Sorokin, P. Z.; Zinov'yeva, A. P.

TITLE: Study of the polycondensation of bis(hydroxymethyl)carborane-(2,10) with succinic acid

SOURCE: Plasticheskiye massy, no. 7, 1965 27-29

TOPIC TAGS: polycondensation, organoboron compound, succinic acid, carborane

ABSTRACT: The basic kinetic relationships governing the equilibrium polycondensation of bis(hydroxymethyl)carborane-(2,10)

$$HOH_2CC\text{---}CCH_2OH$$
$$B_{10}H_{10}$$
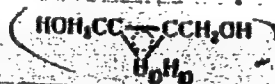
with succinic acid were investigated. It was found that the highest molecular weight of the polyestercarborane produced by the polycondensation was obtained when the reagents were taken in stoichiometric properties. A rise in the reaction temperature increased the reaction rate and also raised the molecular weight. The reaction rate constants,

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ACCESSION NR: AP5018037

extent of the reaction P, and polycondensation coefficient K, were calculated. The activation energy ΔE was found to be 25250 ± 2450 cal/mole. In order of decreasing nucleophilicity, bis(hydroxymethyl)carborane and some hydroxyl-containing compounds can be arranged as follows:

$$C_4H_9OH > HOCH_2CH_2OH > HOH_2CC \underset{B_{10}H_{10}}{\longrightarrow} CCH_2OH > C_6H_5OH$$

The rate of the reaction of bis(hydroxymethyl)carborane with dicarboxylic acids is considerably less than that with aliphatic glycols. Orig. art. has: 4 figures, 4 tables, and 6 formulas.

ASSOCIATION: None

SUBMITTED: 00   ENCL: 00   SUB CODE: OC

NO REF SOV: 005   OTHER: 006

Card 2/2

SVITSYN, R.A.; ZHIGAM , A.P.; SARISHVILI, I.G.; ASKADSKIY, A.A.; SOROKIN, P.Z.

Studying the properties of polyester carboranes. Plast. massy
no.8:18-20 '65.   (MIRA 18:9)

POTAPOVA, T.V.; SVITSYN, R.A.; ZHIGACH, A.F.; LAPTEV, V.T.; PERSIANOVA,
I.V.; SOROKIN, P.Z.

Effect of a carborane ring on the properties of some C-derivatives
of the carborane (2, 10) series. Zhur. neorg. khim. 10 no.9:2080-
2083 S '65.   (MIRA 18:10)

ACC NR: AP6032504   (A, N)   SOURCE CODE: UR/0413/66/000/017/0070/0070

INVENTOR: Zhigach, A. F.; Sobolevskiy, M. V.; Sorokin, P. Z.; Sarishvili, I. G.; Shpak, V. S.; Vilesova, M. S.

ORG: none

TITLE: Preparative method for boron-containing polymers. Class 39, No. 185487

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 17, 1966, 70

TOPIC TAGS: boron-containing polymer, liquid polymer, low molecular weight polymer, chemical synthesis , glycol, polyester resin, decaborane, dicarboxylic acid

ABSTRACT: An Author Certificate has been issued for a method for preparing boron-containing liquid polymers with a molecular weight of 1500—3000 based on polyester-decaborilene [sic]. The method involves preparation of two individual low-molecular-weight esters by reacting at 180C: 1) di(hydroxymethyl)decaborilene [sic] with a dicarboxylic acid [unspecified]; and 2) the dicarboxylic acid with a glycol [unspecified]. The two esters are mixed, heated to about 200C, and held at this temperature in a inert gas for about 50 hr.

SUB CODE: 21, 07/ SUBM DATE: 21Jul62/

Card 1/1   UDC: 678.86.27

TETUSHKIN, A., shturman-aeros"yemshchik; SOROKIN, S., shturman-aeros"yemshchik;
ZHEBKO, V., shturman-aeros"yemshchik; CHUGUNKIN, M., shturman-
aeros"yemshchik.

Improving the training of aerial navigators-photographers. Grazhd.
av. 12 no.7:16 Jl '55.   (MIRA 11:6)
      (Navigation (Aeronautics)) (Photography, Aerial)

RVACHEV, V.P.; SOROKIN, S.A.

Changing synchronous motors over to simplified starting and protection
circuits. Energ.biul. no.12:1-7 D '57.   (MIRA 10:12)
(Electric motors, Synchronous)

KUZ'MENKO, A.P.; STROYKOVSKIY, A.K.; SOROKIN, S.A.

      General solution of Maxwell's equations and its analysis
      for a boundary surface without axial symmetry. Nauch.
      trudy KNIUI no.15:399-413 '64.   (MIRA 18:3)

GURFINKEL', M.A.; SOROKIN, S.F.; ULIKOVSKIY, L.G. Prinimal uchastiye
KUZNETSOV, S.V. D'YACHKOV, V.K., kand.tekhn.nauk; retsenzent;
NIKOLAYEVSKIY, G.M., kand.tekhn.nauk, retsenzent; ZENKOV, R.L.,
doktor tekhn.nauk, red.; SAVEL'YEV, Ye.Ya., red.izd-va;
SOKOLOVA, G.F., tekhn.red.; UVAROVA, A.F., tekhn.red.

[Conveying and loading and unloading machinery used in the chemical
industries] Transportnye i pogruzochno-razgruzochnye mashiny
v khimicheskoi promyshlennosti. Moskva, Gos.nauchno-tekhn.izd-vo
mashinostroit.lit-ry, 1960. 495 p.   (MIRA 13:12)
     (Conveying machinery)   (Loading and unloading)
   (Chemical industries—Equipment and supplies)

S/263/62/000/012/003/005
I007/I207

AUTHOR: Sorokin, S. I., Shrayber, L. S. and Zabelin, V. A.

TITLE: Device for automatic recording of volume changes

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 32. Izmerital'naya tekhnika, no. 12, 1962, 41, abstract 32.12.396 "Nauchn. ezhegodnik. Saratovsk un-t. Fiz. fak. i N.-i. in-t mekhan. i fiz., 1955" Saratov, 1960, 41–47

TEXT: A device is described for automatic recording of volume changes in the gas evolving in a closed system in which chemical reactions occur at constant pressure. The device works on the principle of automatic reduction of pressure within the system to the pressure of the surrounding medium (i.e. to atmospheric pressure). The sensing element of the device consists of a V-shaped differential pressure gage (manometer) whose legs are provided with vertically located moving (threaded) needle contacts. These contacts ensure increased sensitivity of the device: the absolute error in the measurement of volume changes does not exceed $\pm 0.1\%$ of the volume of the burette used in the device. Narrow tubes may be used as gas burettes, permitting the measurement of small volumes (3–5 cm^3) with the above accuracy. The device described was used the authors for determining the quantity of gas evolved during thermal analysis of carbonate rocks.

[Abstracter's note: Complete translation.]

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SOROKIN, S. I.

Evaluation of the structure of Volga diatomites by the sorption of water and benzene vapors. F. A. Silaschenko, E. M. Timofeeva, S. I. Sorokin, and V. A. Zabella (State Pedagog. Inst., Saratov). Zhur. Priklad. Khim. 10, 1127-35(1957).—The sorption-desorption of H_2O and C_6H_6 vapors by diatomaceous earths of the Volga region was detd. by the change in wt. of powd. and grain specimens suspended from a quartz spiral. The curves at 20° are S-shaped, exhibiting irreversible hysteresis with H_2O vapor and reversible hysteresis with C_6H_6. The specific surface of the skeleton calcd. on the assumption of a unimol. layer at the point of beginning of hysterisis agreed with that calcd. by the method of Kiselev (cf. Avgul, et al., C.A. 47, 8079i) and that of Bykov (C.A. 47, 9404h). Exptl. data obtained with grains were more suitable for the study of structures than those obtained with powders. L. B.

ADAMSKIY, N.M.; KARPACHEVA, S.M.; SOROKIN, S.I.

Distibution of carboxylic acids between water and kerosine.
Radiokhimiia 3 no.3:284-290 '61.   (MIRA 14:7)
              (Acids, Fatty)
              (Extraction(Chemistry))

SOROKIN, S.I.; ZABELIN, V.A.

Natural sorbents as desiccants of gases. Khim.prom. no.8:538-539
Ag '61.   (MIRA 14:8)

1. Nauchno-issledovatel'skiy institut mekhaniki i fiziki pri
Saratovskom gosudarstvennom universitete.
              (Gases--Drying) (Sorbents)

KUDRIN, V.A.; OYKS, G.N.; SOROKIN, S.P.; NECHKIN, Yu.M.; GLUSHTSOV, M.V.; NAM, B.P.; LAPSHOVA, M.P.; YUDSON, A.A.; PETRENKO, O.D.; ADRIANOVA, V.P.

Smelting high-grade steel in open-hearth furnaces fired with natural gas. Stal' 20 no. 7:599-602 Jl '60.   (MIRA 14:5)
    (Open-hearth furnaces--Equipment and supplies)

S/130/61/000/012/002/006
A006/A101

AUTHORS: Yakushev, A. M., Kryakovskiy, Yu. V., Tyurin, Ye. I., Sorokin, S. F.,
Yavoyskiy, V. I., Glushtshov, M. V.

TITLE: The effect of rare-earth elements on flake sensitivity of structural
alloyed steels

PERIODICAL: Metallurg, no. 12, 1961, 9-11

TEXT: There are only few data available on the effect of rare-earth
elements on hydrogen behavior in iron and steel and the resulting defects. To
complete these data, workers of the Moscow Steel Institute and the "Krasnyy
Oktyabr'" Plant carried out a series of laboratory and industrial melts. They
were assisted by L. N. Permyakov, M. P. Lapshova, O. D. Petrenko, V. G. Volnyan-
skiy, G. R. Opanchevich, V. A. Grigor'yev and V. P. Bondarev. They studied the
effect of the amount of rare-earth elements (0.3 and 0.5%) on hydrogen solubility
in iron and the effect of the temperature on hydrogen solubility in alloys with
20% and more of these elements. The results have shown that it cannot be expected
that rare-earth elements in the given amounts will eliminate defects of the
steel; on the other hand, the increasing hydrogen sorption capacity at lower

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The effect of rare-earth elements ...

temperatures of alloys containing these elements leads to the expectation that they will bind the hydrogen liberated during the cooling of metal and prevent flake formation. These results were checked by the experimental melting of 37XC (37KhS), 38XCA (38KhSA) and 36Г2C (36G2S) steels containing $6.3 - 8.0$ cm^3/100 g hydrogen, ferrocerium with 94 - 96% Ce, misch metal with 45 - 55% Ce, 25 - 30% La and up to 15% other rare-earth elements. Ingots were heated for 4 - 6 hours at 1,150 - 1,180°C in blooming pits and rolled into 400 - 500 mm air-cooled specimens, which were subjected to breaking tests and etching to establish their flake sensitivity. Results obtained are given in a table and show that the addition of rare-earth elements in amounts exceeding 2.7 kg/t prevent flake formation in 37KhS and 36G2S steel even in profiles of 195 - 225 mm section, under the condition that individual blooms be air-cooled. The experiment has shown that rapid cooling of the blooms will be possible due to the use of rare-earth elements. This will entail a number of economical and technical advantages. There are 1 table and 2 figures.

Card 2/2

KUDRIN, V.A.; AFONIKOV, S.M.; NECHKIN, Yu.M.; SOROKIN, S.P.; TYURIN, Ye.I.;
LAPSHOVA, M.P.; YUDSON, A.A.; POPOV, Ye.S.

Performance of a 30 ton open-hearth furnace with a roof gas
and oxygen burner. Metallurg 10 no.1:14-16 Ja '65.

(MIRA 18:4)

TIMOFEYEV, N.N.; ANOKHINA, A.D.; SOROKIN, S.F.; DROZHEVSKIY, N.P.;
     GLUSHTSOV, M.V.; LARIONOV, A.S.; KOZLITIN, G.I.

Block lining of the upper structure of open-hearth furnaces.
Ogneupory 30 no.11:8-10 '65.   (MIRA 18:11)

1. Vsesoyuznyy institut ogneuporov (for Timofeyev, Anokhina).
2. Volgogradskiy metallurgicheskiy zavod "Krasnyy Oktyabr'"
(for Sorokin, Drozhevskiy, Glushtsov, Larionov, Kozlitin).